304

INTEGRATED
AMPLIFIER

304
INTEGRATED
AMPLIFIER

SERVICE MANUAL

NAD

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SERVICE SAFETY PRECAUTIONS

1. Use exact replacement parts for critical locations, marked " ⚠ " on parts list.
2. Return lead dress to original position, and re-install protective covers.
3. Before returning to customer, test for shock hazard; use either method A or B:

A. Leakage test, "cold":

1. Unplug AC cord, turn power switch ON.
2. Connect one lead of High Voltage Insulation Tester to both prongs of AC plug.
3. Touch other lead to all exposed metal parts.
4. Impedance measurement must be 0.3 – 5.0 Megohms.

B. Leakage test, "live":

1. Plug unit directly into AC outlet; do not use isolation transformer.
2. Connect one lead of Leakage Current Tester to earth ground.
3. Touch other lead to all exposed metal parts.
4. Leakage measurement must be less than 0.5 milliamps.

PREAMPLIFIER SECTION

PHONO INPUT

Input impedance (R and C)		**MM: 47 kohms + 200 pF**
Input sensitivity (ref. rated power, 1 kHz)		**MM: 2.5 mV**
Input overload at 20 Hz / 1 kHz / 20 kHz		**MM: 22 mV / 220 mV / 2.0V**
THD (20 Hz – 20 kHz) and IM dist.		**< 0.1% at +30 dB level**
RIAA accuracy		**± 0.5 dB**
Signal / Noise ratio (A-weighted with cartridge connected)		**MM: 77 dB ref. 5 mV**

LINE LEVEL INPUTS
(CD, Video, Auxiliary, Tuner, Tape)

Input impedance (R and C)		**20 kohms + 500 pF**
Input sensitivity (ref. rated power)		**165 mV**
Maximum input signal		**> 10V**
Signal / Noise ratio, A-weighted		**91 dB ref. 1 W** **106 dB ref. rated power**
Frequency response, 20 Hz – 20 kHz		**+ 0/–0.3 dB (tone defeat)** **± 0.5 dB (tone flat)**
THD, SMPTE IM, IHF IM and TIM		**< 0.01% at 5 V out**

LINE LEVEL OUTPUTS

Preamp output impedance		**220 ohms**
Tape output impedance		**Source Z + 2 kohms**
Headphones output impedance		**220 ohms**
Maximum output level	preamp-out :	**> 12 V**
	tape-out :	**> 10 V**
	headphones-out :	**> 10 V into 600 ohms** **> 500 mV into 8 ohms**

CONTROLS

Treble	**± 7 dB at 10 kHz**
Bass	**± 10 dB at 50 Hz**
Infrasonic filter (fixed)	**– 3 dB at 10 Hz** **12 dB / octave**

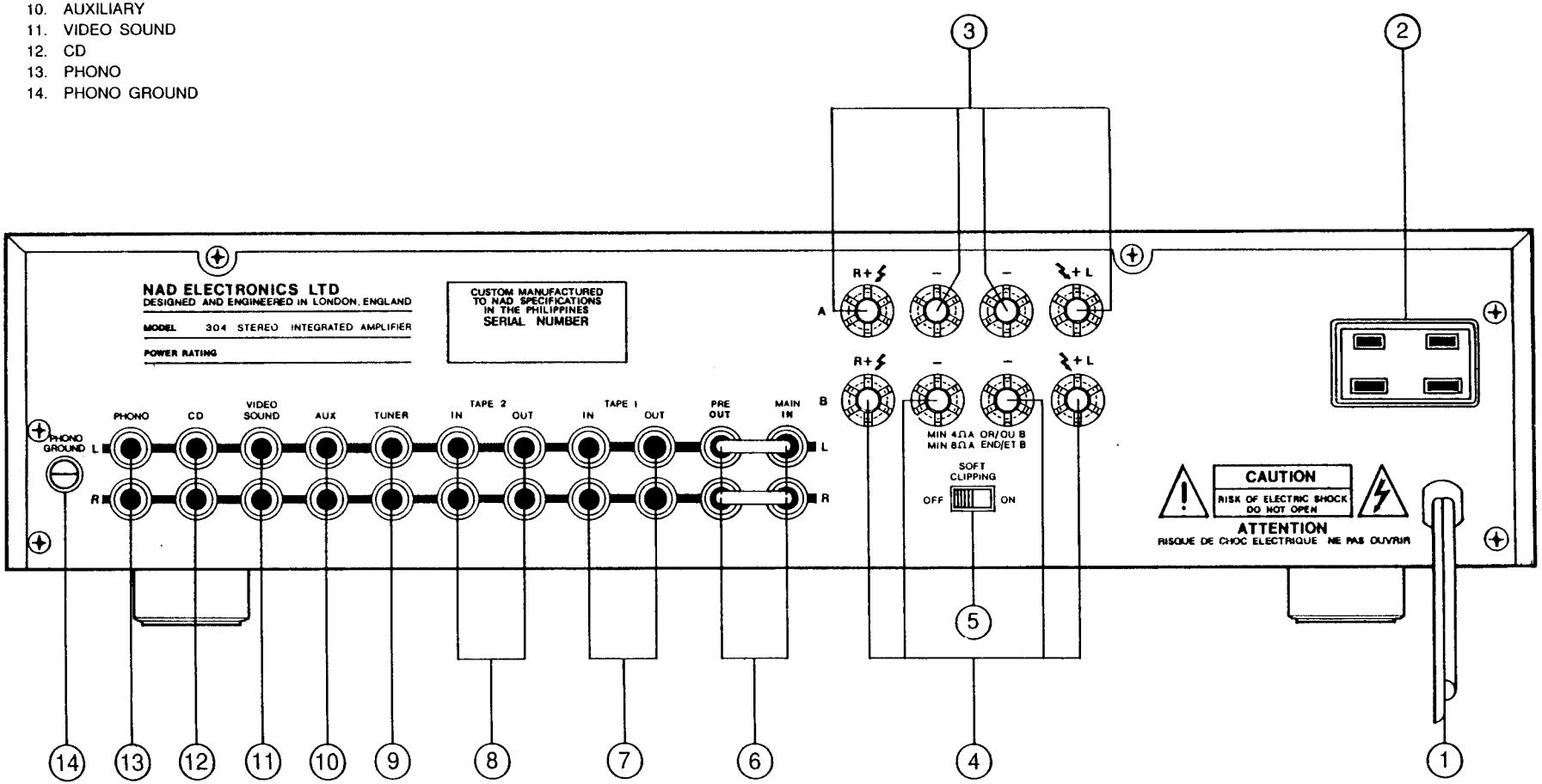
SPECIFICATIONS

POWER AMPLIFIER SECTION
STEREO MODE

CONTINUOUS AVERAGE POWER OUTPUT INTO 8 OHMS (Min. power per channel, 20 Hz – 20 kHz, both channels driven, with no more than rated distortion)	**35 W (15.5 dBW)**
Rated Distortion (THD 20 Hz – 20 kHz)	**0.03%**
Clipping power (maximum continuous power per channel).	**42 W**
IHF dynamic headroom at 8 ohms	**+ 5.5 dB**
IHF dynamic power (maximum short term power per channel) 8 ohms: 4 ohms: 2 ohms:	 **120 W (21 dBW)** **160 W (22 dBW)** **200 W (23 dBW)**
Slew rate	**> 20 V / µsec**
Damping factor (ref. 8 ohms 50 Hz)	**> 100**
Input Impedance	**R = 18 kohms** **C = 560 pF**
Input sensitivity (for rated output into 8 ohms)	**1 V**
Voltage gain	**x17 (24.6 dB)**
Frequency response 20 Hz – 20 kHz	**± 0.3 dB** **– 3 dB at 3 Hz / 70 kHz**
Signal / Noise ratio, A-weighted	**102 dB ref. 1 W** **117 dB ref. 35 W**
THD (Total Harmonic Distortion, 20 Hz – 20 kHz, from 250 mW to rated output)	**< 0.03%**
SMPTE I.M. (Intermodulation Distortion, 60 Hz + 7 kHz, 4:1, from 250 mW to rated output)	**< 0.03%**
IHF I.M. (CCIF IM Distortion, 19 + 20 kHz at rated output)	**< 0.03%**

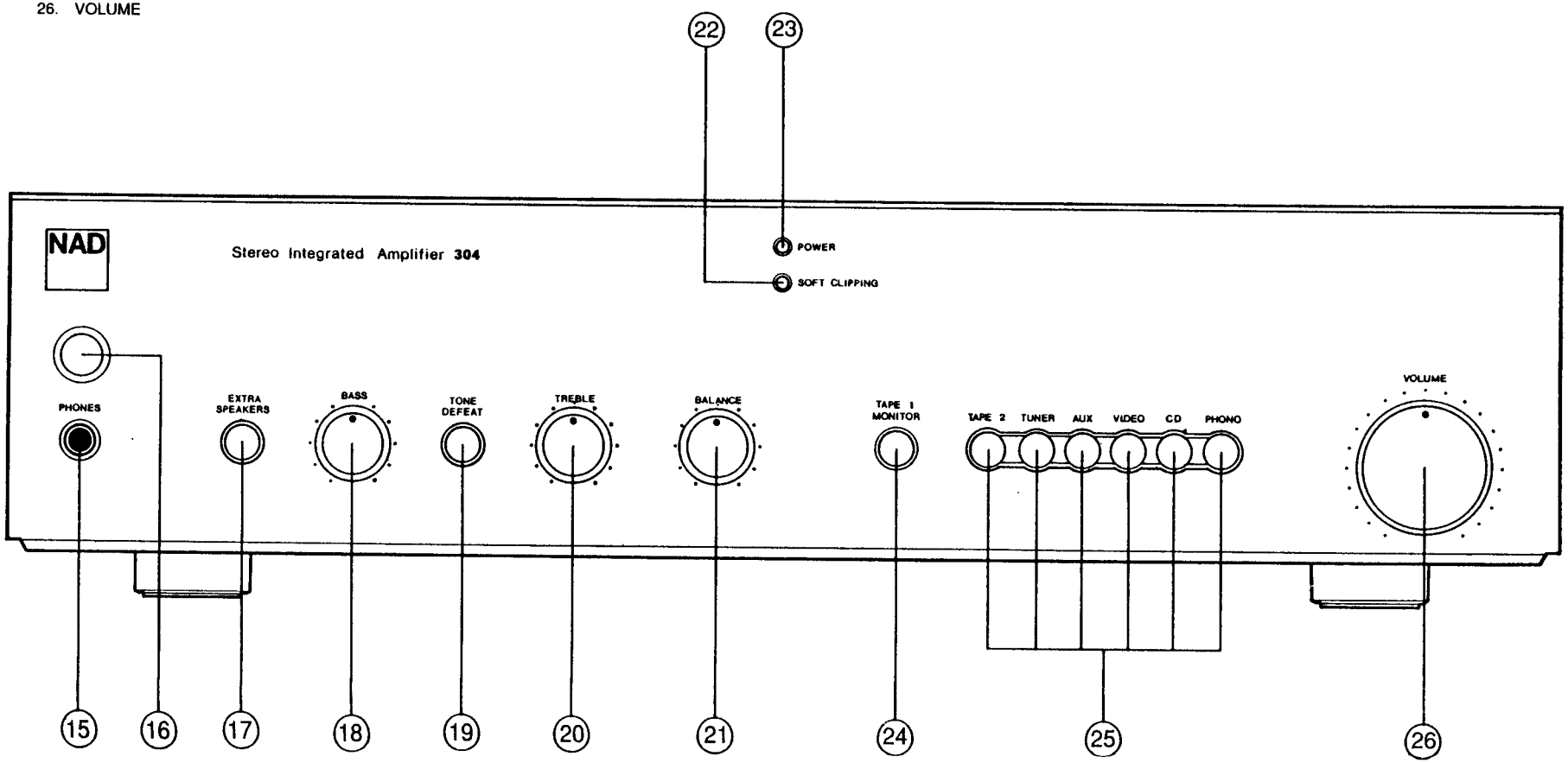
REAR PANEL CONNECTIONS

1. AC LINE CORD
2. AC OUTLET (AH ONLY)
3. SPEAKER A TERMINAL
4. SPEAKER B TERMINAL
5. SOFT CLIPPING
6. PRE AMP OUT/MAIN IN
7. TAPE 1 INPUT/OUTPUT
8. TAPE 2 INPUT/OUTPUT
9. TUNER
10. AUXILIARY
11. VIDEO SOUND
12. CD
13. PHONO
14. PHONO GROUND



FRONT PANEL FUNCTIONS

15. PHONES
16. POWER
17. EXTRA SPEAKERS
18. BASS
19. TONE DEFEAT
20. TREBLE
21. BALANCE
22. SOFT CLIPPING INDICATOR
23. POWER INDICATOR
24. TAPE 1 MONITOR
25. INPUT SELECTOR
26. VOLUME



ALIGNMENT PROCEDURE

I. INITIAL ADJUSTMENT (No load connected)

A. OUTPUT OFFSET VOLTAGE

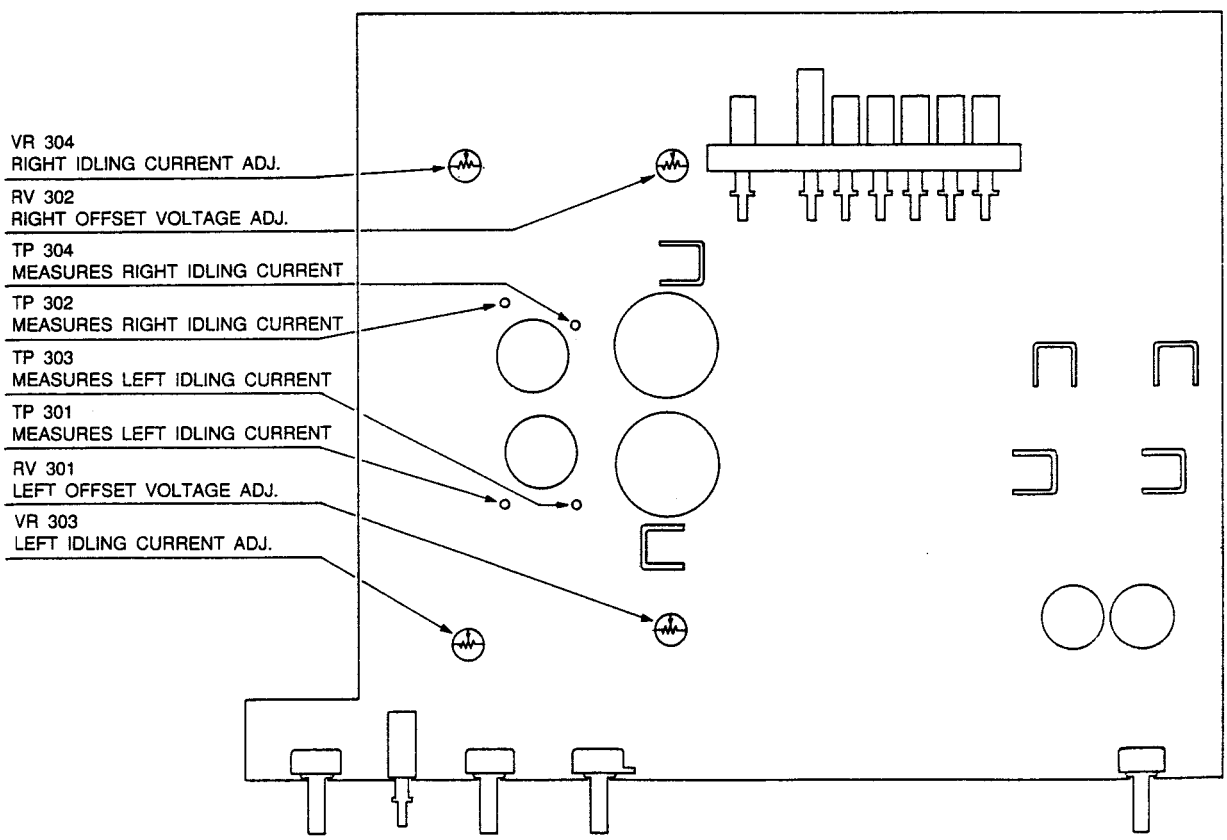
1. Connect a DC Millivoltmeter to L Channel speaker output terminals.
2. Turn unit "ON" and adjust RV301 (10 kohms) to get a reading of 0V ±10 mV.
3. Connect the DC Millivoltmeter to R Channel speaker output terminals and adjust RV 302 (10 kohms) to get a reading of 0V ±10 mV.

B. IDLING CURRENT

1. Connect a DC Millivoltmeter to TP301 and TP303 and adjust VR303 (1 kohms) for 5.7 – 6.4 mV reading on meter.
2. Connect the DC Millivoltmeter to TP302 and TP304 and adjust VR304 (1 kohms) for 5.7 – 6.4 mV reading on meter.
3. Leave power "ON" for minimum of 5 minutes.

II. FINAL ADJUSTMENT

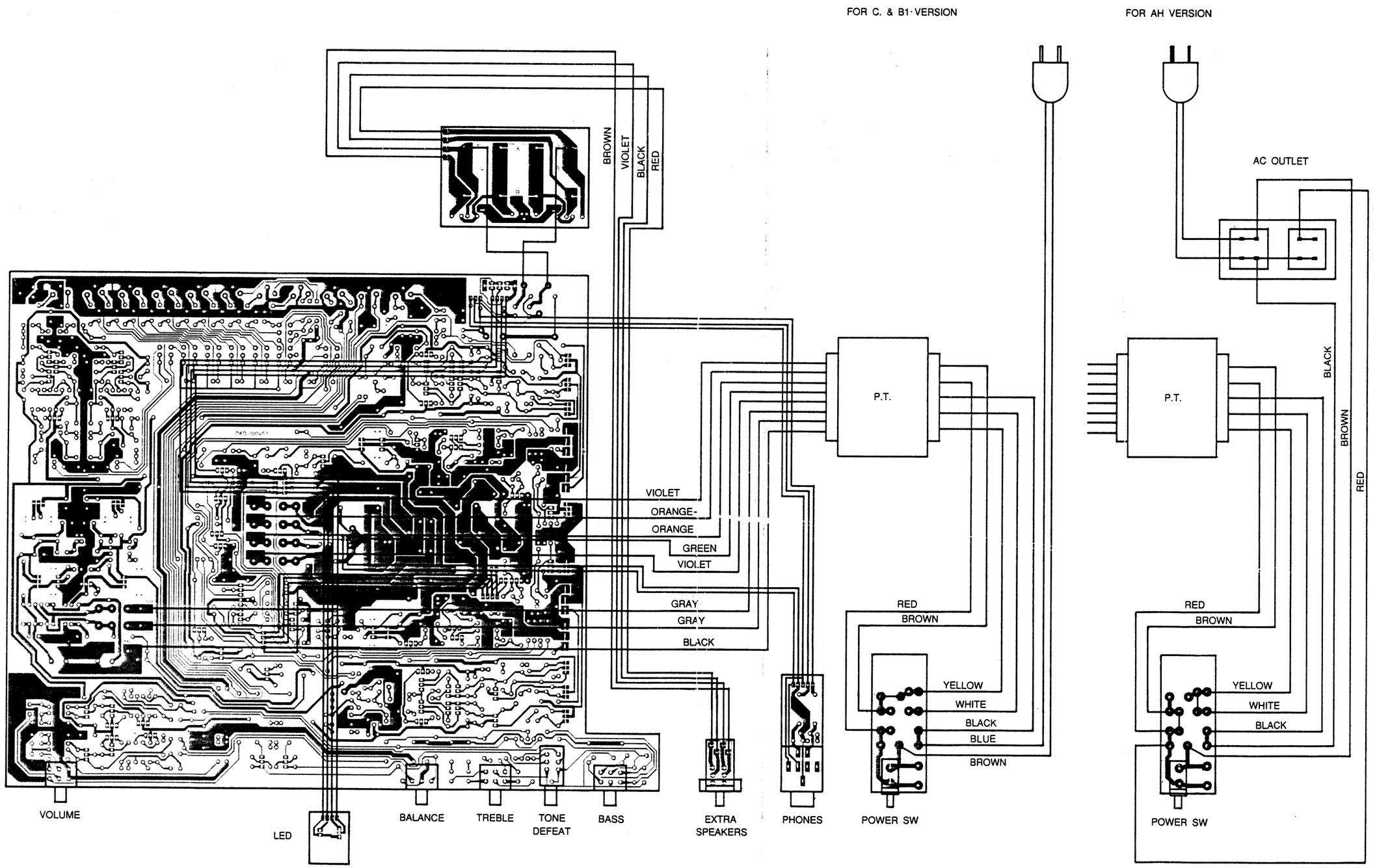
Repeat procedure A and B for offset voltage and idling current alignment respectively.



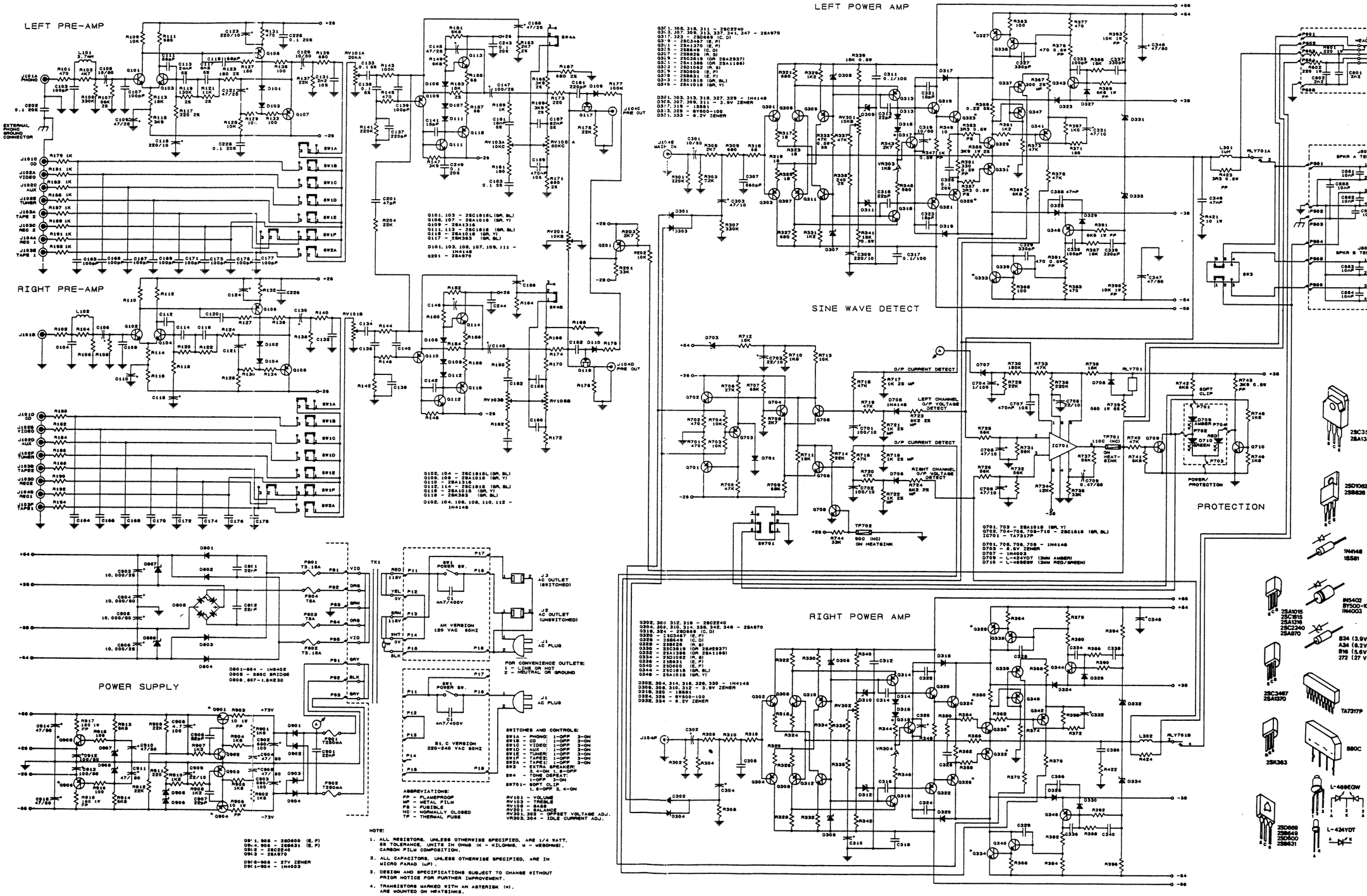
EXPLODED VIEW PARTS LIST

ITEM	PART NUMBER	DESCRIPTION	QTY/UNIT
1	061–00001	Fascia	1 pc
2	062–00001	Knob 35.0mm (Volume)	1 pc
3	062–00002	Knob 18.5mm (Bass, Treble, Balance)	3 pcs
4	062–00003	Long Button 9.5mm (Power)	1 pc
5	063–00002	Power Button Extender	1 pc
6	062–00004	Long Button 8.0mm (Input Select)	9 pcs
7	063–00001	Button Extender (Input Select)	7 pcs
8	064–00001	Plastic Foot	4 pcs
9	065–00001	Pointer	4 pcs
10	136–00650	Nut 6.5mm	4 pcs
11	134–00712	Washer 7x12mm	4 pcs
12	134–00315	Washer 3x15mm	1 pc
13	134–00307	Washer 3x7mm	4 pcs
14	101–00001	Subfascia	1 pc
15	101–00005	Right Side Panel	1 pc
16 * AH	101–00002	Rear Panel * AH only	1 pc
16 * C,B1	101–00003	Rear Panel * C & B1 only	1 pc
17	101–00004	Left Side Panel	1 pc
18	101–00006	Top Cover PVC Coated	1 pc
19	101–00007	Base	1 pc
20	102–00001	Heatsink Extrusion (NAD 001)	2 pcs
21	102–00002	Heatsink Mounting Bar Extrusion (NAD 002)	1 pc
22	102–00003	Commutation Transistor Heatsink A	2 pcs
23	102–00004	60V Regulator Transistor Heatsink B	2 pcs
24	102–00005	28V Regulator Transistor Heatsink C	2 pcs
25	060–00001A	Mains PCB Assy. (Part of PCB 060–00001)	1 pc
26	060–00001B	Speaker PCB Assy. (Part of PCB 060–00001)	1 pc
27	060–00001C	LED PCB Assy. (Part of PCB 060–00001)	1 pc
28	060–00001D	Headphone Assy. (Part of PCB 060–00001)	1 pc
29	060–00001E	Extra Spkr. Switch PCB Assy. (Part of PCB 060–00001)	1 pc
30	060–00001F	Amp. PCB Assy. (Part of PCB 060–00001)	1 pc
31	092–10001	See page 19 TX1	1 pc
32	072–19320	See page 18 RV101	1 pc
33	075–49310	See page 18 RV201	1 pc
34	073–39310	See page 18 RV103	1 pc
35	073–39350	See page 18 RV105	1 pc
36	081–00002	See page 18 SW1	1 pc
37	081–00003	See page 18 SW3	1 pc
38	081–00004	See page 18 SW4	1 pc
39	081–00001	See page 18 SW1A–F / SW2A	1 pc
40	081–00005	See page 18 SW701	1 pc
41	082–00007	See page 19 J501, J502	2 pcs
42	082–00002	See page 19 J101	1 pc
43	082–00003	See page 19 J102, J103, J104	3 pcs
44	082–00008	See page 19 J601	1 pc
45	140–00001	Sleeve, Big (D = 30mm, L = 77mm)	1 pc
46	140–00007	Silicone Sheet, Small	8 pcs
47	140–00008	Mica Insulator, Big	4 pcs

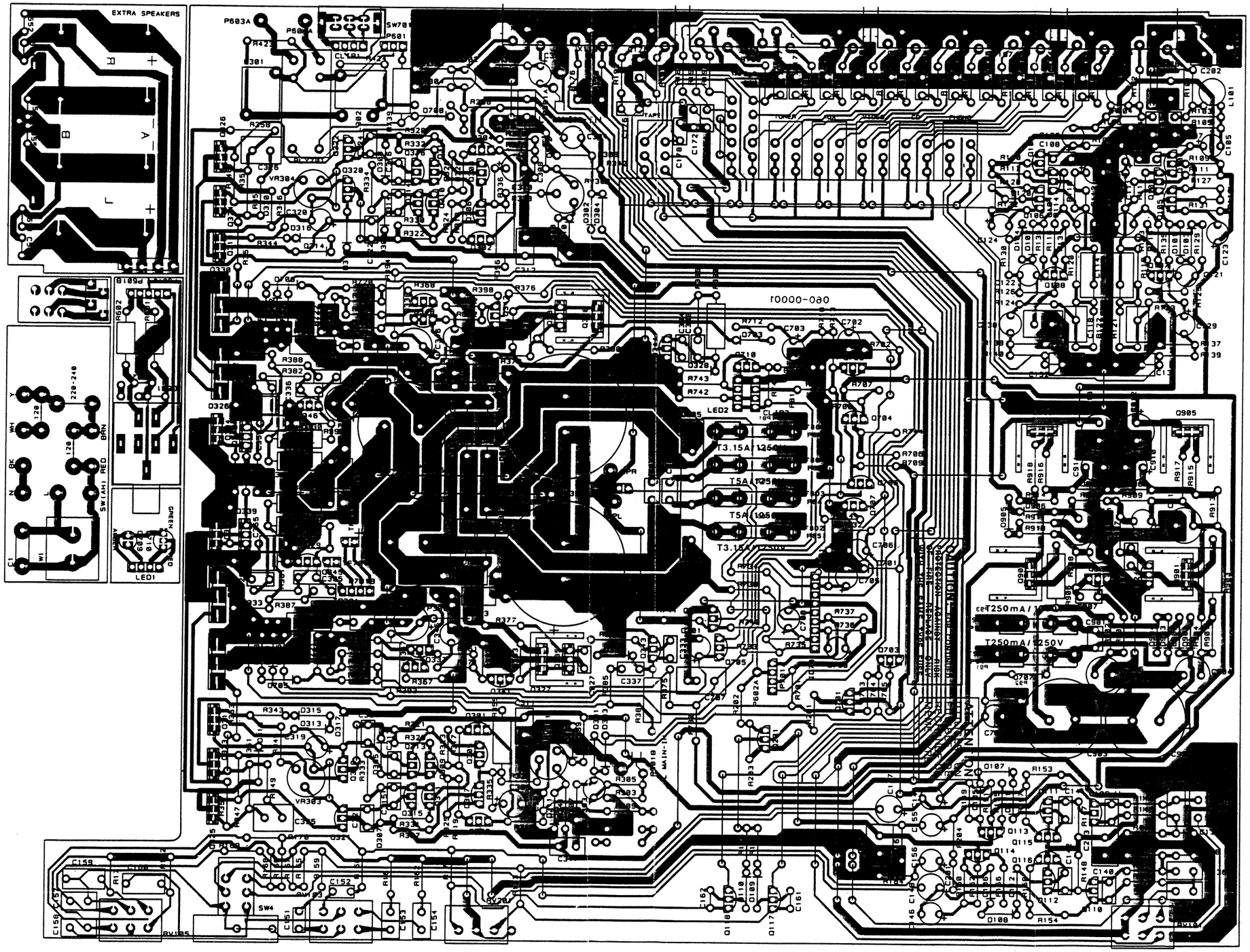
WIRING DIAGRAM



SCHEMATIC DIAGRAM


LEFT PRE-AMP
RIGHT PRE-AMP
POWER SUPPLY
LEFT POWER AMP
SINE WAVE DETECT
RIGHT POWER AMP
PROTECTION
Q101, 103 - 2SC1815L (GR, BL)
Q106, 107 - 2SA1016 (GR, Y)
Q109 - 2SA1316
Q111, 113 - 2SC1815 (GR, BL)
Q116 - 2SA1016 (GR, Y)
Q117 - 2SK363 (GR, BL)
Q101, 103, 106, 107, 109, 111 - 1N4148
Q201 - 2SA970
Q102, 104 - 2SC1815L (GR, BL)
Q105, 108 - 2SA1015 (GR, Y)
Q110 - 2SA1316
Q112, 114 - 2SC1815 (GR, BL)
Q115 - 2SA1015 (GR, Y)
Q118 - 2SK363 (GR, BL)
Q102, 104, 106, 108, 110, 112 - 1N4148
Q301, 303, 313, 316, 327, 329 - 2SC2240
Q302, 304, 310, 312 - 2SA970
Q317, 323 - 2SD669 (C, D)
Q318, 324 - 2SD669 (C, D)
Q320 - 2SC3467 (E, F)
Q321 - 2SA1370 (E, F)
Q325 - 2SB649 (C, D)
Q326 - 2SB826 (R, S)
Q329 - 2SC3519 (OR 2SA2837)
Q331 - 2SA1386 (OR 2SA1186)
Q332 - 2SD1062 (R, S)
Q334 - 2SD400 (E, F)
Q336 - 2SB631 (E, F)
Q339 - 2SC1815 (GR, BL)
Q346 - 2SA1015 (GR, Y)
Q301, 303, 313, 316, 327, 329 - 1N4148
Q305, 307, 309, 311 - 3.9V ZENER
Q317, 319 - 1SS81
Q313, 328 - RY800-100
Q321, 333 - 8.2V ZENER
Q701, 703 - 2SA1015 (GR, Y)
Q702, 704-708, 709-710 - 2SC1815 (GR, BL)
IC701 - TA7317P
Q701, 705, 706, 708 - 1N4148
Q703 - 5.6V ZENER
Q707 - 1N4003
Q709 - L-424YDT (3MM AMBER)
Q710 - L-469EGW (3MM RED/GREEN)
Q901, 903 - 2SD600 (E, F)
Q904, 906 - 2SB631 (E, F)
Q905 - 2SC2240
Q902 - 2SA970
D905-908 - 27V ZENER
D901-904 - 1N4003
SW1 POWER SW.
AM VERSION 120 VAC 60HZ
E, C VERSION 220-240 VAC 50HZ
FOR CONVENIENCE OUTLETS:
1 - LINE OR HOT
2 - NEUTRAL OR GROUND
SWITCHES AND CONTROLS:
SW1A - PHONO: 1-OFF 3-ON
SW1B - CD: 1-OFF 3-ON
SW1C - VIDEO: 1-OFF 3-ON
SW1D - AUX: 1-OFF 3-ON
SW1E - TUNER: 1-OFF 3-ON
SW1F - TAPE1: 1-OFF 3-ON
SW2A - TAPE1: 1-OFF 3-ON
SW3 - EXTRA SPEAKER: 3, 4-ON 1, 6-OFF
SW4 - TONE DEFEAT: 1-OFF 3-ON
SW701 - SOFT CLIP: 1, 6-OFF 3, 4-ON
ABBREVIATIONS:
FR - FLAMEPROOF
MF - METAL FILM
FB - FUSIBLE
NC - NORMALLY CLOSED
TF - THERMAL FUSE
RV101 - VOLUME
RV102 - TREBLE
RV103 - BASS
RV104 - BALANCE
RV301, 302 - OFFSET VOLTAGE ADJ.
VR303, 304 - IDLE CURRENT ADJ.
NOTE:
1. ALL RESISTORS, UNLESS OTHERWISE SPECIFIED, ARE 1/4 WATT, 5% TOLERANCE. UNITS IN OHMS (K - KILOHMS, M - MEGOHMS). CARBON FILM COMPOSITION.
2. ALL CAPACITORS, UNLESS OTHERWISE SPECIFIED, ARE IN MICRO FARAD (uF).
3. DESIGN AND SPECIFICATIONS SUBJECT TO CHANGE WITHOUT PRIOR NOTICE FOR FURTHER IMPROVEMENT.
4. TRANSISTORS MARKED WITH AN ASTERISK (*). ARE MOUNTED ON HEATSINKS.
2SC3519 2SA1386
2SD1062 2SB826
1N4148 1SS81
1N5402 SY500-100 1N4003
2SA1015 2SC1815 2SA1316 2SC2240 2SA970
B24 (3.9V) A34 (8.2V) B16 (5.6V) 272 (27 V)
2SC3467 2SA1370
TA7317P
S80C
2SK363
L-469EGW
L-424YDT
2SD669 2SB649 2SD600 2SB631

PCB LAY-OUT


EXTRA SPEAKERS
P603A
P603B
SW701
P601
R423
D301
D708
R358
R328
R332
D326
C325
VR304
D320
R334
R336
D316
R330
R322
D314
R344
R316
R312
R368
R398
R376
R712
C703
C702
D703
R743
R742
LED2
R707
D704
R706
R709
T3.15A
T5A
T5A
T3.15A
C706
C705
R737
R738
D705
C337
R327
R343
D315
D313
D317
C319
R320
R333
R335
R305
R303
VR303
C315
D307
R331
R329
R319
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R313
R318
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R306
R304
R302
R301
C158
C159
C157
C151
C152
C153
C154
SW4
SW3
RV105
RV701
C162
C161
D118
D189
D117
R146
C146
D108
R154
C148
C147
D112
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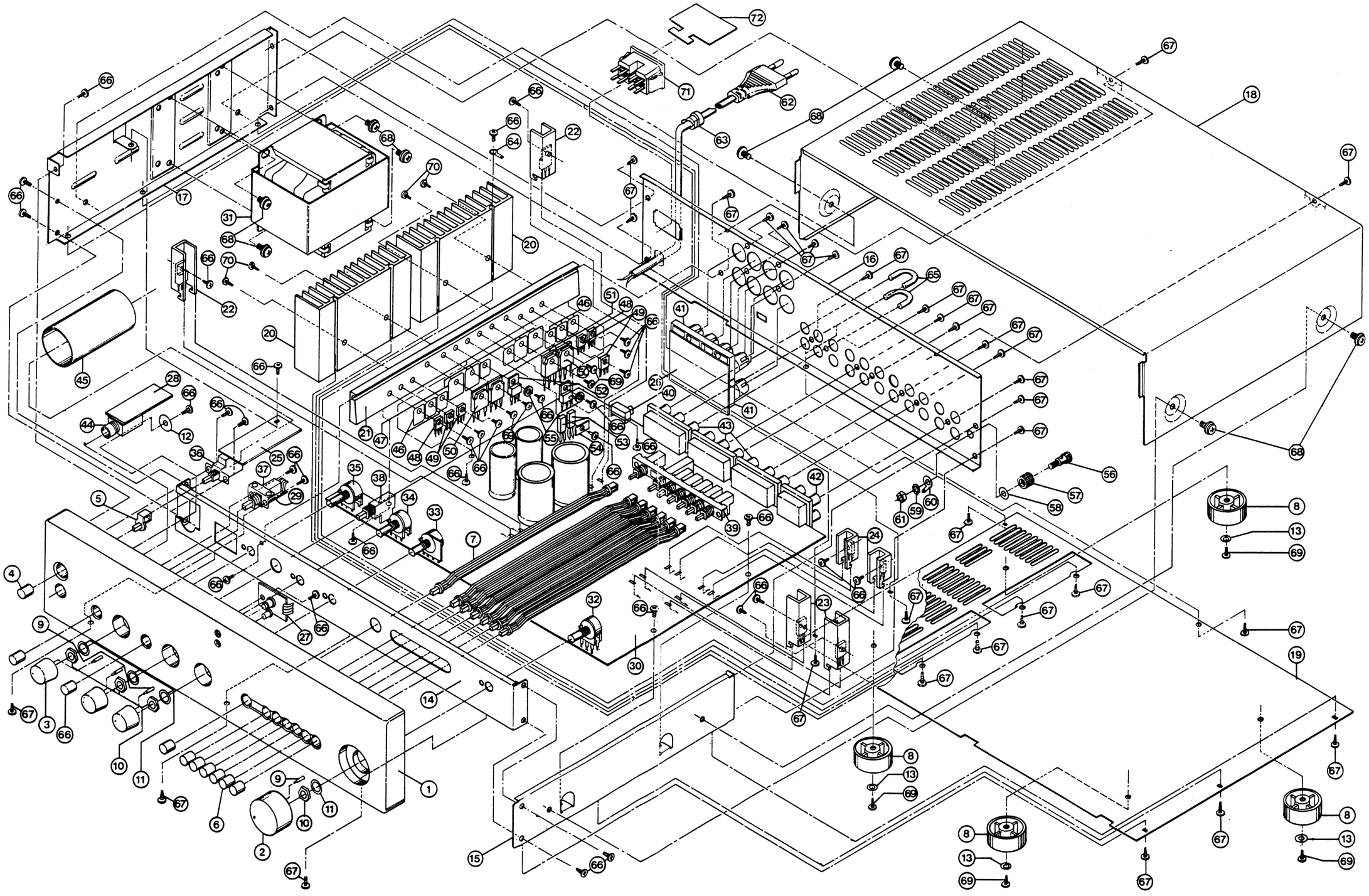
EXPLODED VIEW



EXPLODED VIEW PARTS LIST (CONTINUATION)

ITEM	PART NUMBER	DESCRIPTION	QTY/UNIT
48	042–2SB649	See page 18 Q325, Q324	2 pcs
49	042–2SD669	See page 18 Q317, Q318, Q323, Q324	4 pcs
50	042–2SC3519	See page 18 Q329, Q330	2 pcs
51	042–2SA1386	See page 18 Q331, Q332	2 pcs
52	042–2SD1062R	See page 18 Q333, Q334	2 pcs
53	081–00006/7	See page 18 TF701, TF702	2 pcs
54	101–00008	Thermal Switch Clip	1 pc
55	140–00010	Transistor Bushing	2 pcs
56	082–00010A	Stud (Part of Thumb Screw 082–00010)	1 pc
57	082–00010B	Bushing (Part of Thumb Screw 082–00010)	1 pc
58	082–00010C	Washer (Part of Thumb Screw 082–00010)	1 pc
59	082–00010D	External Tooth Washer (Part of Thumb Screw 082–00010)	1 pc
60	082–00010E	Solder Lug (Part of Thumb Screw 082–00010)	1 pc
61	082–00010F	Nut 3.0mm (Part of Thumb Screw 082–00010)	1 pc
62 * AH	082–00004	See page 19 J1 * AH	1 pc
62 * C	082–00005	See page 19 J1 * C	1 pc
62 * B1	082–00006	See page 19 J1 * B1	1 pc
63	140–00006	Strain Relief	1 pc
64	133–00307	Solder Lug 3x7mm	1 pc
65	103–00001	Shorting Bar (Pre Out/Main In)	2 pcs
66	131–41308	ST 3x8mm, Binding Head (Zinc)	34 pcs
67	131–42308	ST 3x8mm, Binding Head (Black)	32 pcs
68	135–12406	M 4x6mm, Panhead (Black) w/built-in Washer	8 pcs
69	132–40308	M 3x8mm, Binding Head (Zinc)	8 pcs
70	131–11308	ST 3x8mm, 5.2 dia. Head (Panhead), Zinc	4 pcs
71	082–00001	See page 19 J2, J3	1 pc
72	066–00001	AC Outlet Cover Plate (AH Only)	1 pc

ELECTRICAL PARTS LIST

SYMBOL NUMBER	REFERENCE NUMBER	PART NUMBER	DESCRIPTION
RESISTORS			
R349, R350	011-29010	011-29010	10 0.25W ±5% Carbon Film Resistor
R317, R318, R319, R320, R323, R324, R325, R326	011-29018	011-29018	18 0.25W ±5% Carbon Film Resistor
R155, R156, R157, R158, R315, R316	011-29068	011-29068	68 0.25W ±5% Carbon Film Resistor
R133, R134, R135, R136, R363, R364, R365, R366, R915, R916	011-29110	011-29110	100 0.25W ±5% Carbon Film Resistor
R127, R128	011-29115	011-29115	150 0.25W ±5% Carbon Film Resistor
R161, R162, R371, R372	011-29118	011-29118	180 0.25W ±5% Carbon Film Resistor
R173, R174, R911	011-29122	011-29122	220 0.25W ±5% Carbon Film Resistor
R101, R102, R131, R132, R145, R146, R377, R378, R383, R384, R701, R702	011-29147	011-29147	470 0.25W ±5% Carbon Film Resistor
R345, R346	011-29156	011-29156	560 0.25W ±5% Carbon Film Resistor
R111, R112, R139, R140, R309, R310, R321, R322, R327, R328	011-29168	011-29168	680 0.25W ±5% Carbon Film Resistor
R159, R160, R179, R180, R181, R182, R183, R184, R185, R186, R187, R188, R189, R190, R191, R192, R193, R194	011-29210	011-29210	1K 0.25W ±5% Carbon Film Resistor
R329, R330, R331, R332, R361, R362, R907, R908, R910	011-29212	011-29212	1K2 0.25W ±5% Carbon Film Resistor
R397, R398, R710, R745, R746, R901, R902, R904, R905	011-29215	011-29215	1K5 0.25W ±5% Carbon Film Resistor
R203, R305, R306, R343, R344, R708	011-29227	011-29227	2K7 0.25W ±5% Carbon Film Resistor
R115, R116, R147, R148	011-29239	011-29239	3K9 0.25W ±5% Carbon Film Resistor
R103, R104	011-29247	011-29247	4K7 0.25W ±5% Carbon Film Resistor
R149, R150, R151, R152, R369, R370, R741, R742, R913, R914	011-29268	011-29268	6K8 0.25W ±5% Carbon Film Resistor
R109, R110, R125, R126, R129, R130, R202, R703, R704, R713 R734	011-29310	011-29310	10K 0.25W ±5% Carbon Film Resistor
R113, R114, R385, R386, R387, R388, R712, R738	011-29312	011-29312	12K 0.25W ±5% Carbon Film Resistor
R711	011-29315	011-29315	15K 0.25W ±5% Carbon Film Resistor
R137, R138, R175, R176, R204, R303, R304, R714, R728, R909, R912	011-29318	011-29318	18K 0.25W ±5% Carbon Film Resistor
R706	011-29322	011-29322	22K 0.25W ±5% Carbon Film Resistor
R201, R736, R744	011-29327	011-29327	27K 0.25W ±5% Carbon Film Resistor
R337, R338, R373, R374, R375, R376, R705, R715, R716, R719, R720, R733, R740	011-29333	011-29333	33K 0.25W ±5% Carbon Film Resistor
R725, R726, R731, R732, R737	011-29347	011-29347	47K 0.25W ±5% Carbon Film Resistor
R707, R709	011-29356	011-29356	56K 0.25W ±5% Carbon Film Resistor
R143, R144, R177, R178	011-29368	011-29368	68K 0.25W ±5% Carbon Film Resistor
R730	011-29410	011-29410	100K 0.25W ±5% Carbon Film Resistor
R141, R142, R301, R302, R735	011-29415	011-29415	150K 0.25W ±5% Carbon Film Resistor
R105, R106, R307, R308	011-29422	011-29422	220K 0.25W ±5% Carbon Film Resistor
R339, R340, R341, R342	011-29433	011-29433	330K 0.25W ±5% Carbon Film Resistor
R333, R334	011-39315	011-39315	15K 0.5W ±5% Carbon Film Resistor
	011-39347	011-39347	47K 0.5W ±5% Carbon Film Resistor

ELECTRICAL PARTS LIST (CONTINUATION)

SYMBOL NUMBER	REFERENCE NUMBER	PART NUMBER	DESCRIPTION
R739	011-49156	011-49156	560 1W ±5% Carbon Film Resistor
R601, R602	011-49122	011-49122	220 1W ±5% Carbon Film Resistor
R123, R124	012-29118	012-29118	180 0.25W ±2% Metal Film Resistor
R117, R118	012-29122	012-29122	220 0.25W ±2% Metal Film Resistor
R335, R336	012-29124	012-29124	240 0.25W ±2% Metal Film Resistor
R367, R368	012-29130	012-29130	300 0.25W ±2% Metal Film Resistor
R167, R168, R171, R172	012-29168	012-29168	680 0.25W ±2% Metal Film Resistor
R717, R718, R721, R722	012-29210	012-29210	1K 0.25W ±2% Metal Film Resistor
R163, R164	012-29227	012-29227	2K7 0.25W ±2% Metal Film Resistor
R165, R166, R169, R170	012-29239	012-29239	3K9 0.25W ±2% Metal Film Resistor
R723, R724	012-29262	012-29262	6K2 0.25W ±2% Metal Film Resistor
R121, R122	012-29311	012-29311	11K 0.25W ±2% Metal Film Resistor
R153, R154	012-29315	012-29315	15K 0.25W ±2% Metal Film Resistor
R107, R108	012-29356	012-29356	56K 0.25W ±2% Metal Film Resistor
R119, R120	012-29413	012-29413	130K 0.25W ±2% Metal Film Resistor
R355, R356	012-49239	012-49239	3K9 1W ±2% Metal Film Resistor
R423, R424	013-38233	013-38233	3R3 0.5W ±5% Flame Proof Resistor
R351, R352	013-39133	013-39133	330 0.5W ±5% Flame Proof Resistor
R379, R380, R381, R382	013-39147	013-39147	470 0.5W ±5% Flame Proof Resistor
R347, R348	013-39210	013-39210	1K 0.5W ±5% Flame Proof Resistor
R743	013-39239	013-39239	3K9 0.5W ±5% Flame Proof Resistor
R903, R906	013-49010	013-49010	10 1W ±5% Flame Proof Resistor
R917, R918	013-49118	013-49118	180 1W ±5% Flame Proof Resistor
R389, R390, R391, R392	013-49268	013-49268	6K8 1W ±5% Flame Proof Resistor
R393, R394, R395, R396	013-49310	013-49310	10K 1W ±5% Flame Proof Resistor
R353, R354, R357, R358	014-48233	014-48233	3R3 1W ±5% Fusible Resistor
R421, R422	014-49010	014-49010	10 1W ±5% Fusible Resistor
R359, R360	015-58122	015-58122	0.22 2W ±5% Wirewound Ceramic Resistor
CAPACITORS			
C141, C142, C321, C322, C323, C324	022-47015M	022-47015M	15pF 500V Ceramic Disk Capacitor
C313, C314, C315, C316, C906, C907	022-47022M	022-47022M	22pF 500V Ceramic Disk Capacitor
C201	021-77047M	021-77047M	47pF 50V Ceramic Disk Capacitor
C111, C112	021-77056M	021-77056M	56pF 50V Ceramic Disk Capacitor
C119, C120	021-77068M	021-77068M	68pF 50V Ceramic Disk Capacitor
C103, C104, C107, C108, C139 C140, C163, C164, C165, C166, C167, C168, C169, C170, C171, C172, C173, C174, C175, C176, C177, C178	021-77110M	021-77110M	100pF 50V Ceramic Disk Capacitor
C333, C334, C335, C336	022-47110M	022-47110M	100pF 500V Ceramic Disk Capacitor
C137, C138, C161, C162	021-77122M	021-77122M	220pF 50V Ceramic Disk Capacitor
C327, C328, C329, C330, C337, C338, C339, C340	022-47133M	022-47133M	330pF 500V Ceramic Disk Capacitor
C307, C308	021-77156M	021-77156M	560pF 50V Ceramic Disk Capacitor
C601, C602	021-77222M	021-77222M	2.2nF 50V Ceramic Disk Capacitor
C551, C552, C553, C554, C555, C556	022-08010M	022-08010M	10nF 100V Ceramic Disk Capacitor
C1	022-37247M	022-37247M	4.7nF 400V UL, CSA, VDE Ceramic Disk Capacitor
C151, C152	023-78018J	023-78018J	18nF 50V ±5% Polyester Film Capacitor
C801, C802, C901	024-28022M	024-28022M	22nF 250V ±20% Polyester Film Capacitor

ELECTRICAL PARTS LIST (CONTINUATION)

SYMBOL NUMBER	REFERENCE NUMBER	PART NUMBER	DESCRIPTION
C349, C350, C355, C356	024-08047M	024-08047M	47nF 100V ±20% Polyester Film Capacitor
C157, C158	023-78082J	023-78082J	82nF 50V ±5% Polyester Film Capacitor
C133, C134, C135, C136, C153, C154	023-78110J	023-78110J	100nF 50V ±5% Polyester Film Capacitor
C202, C225, C228, C243, C249, C325, C326	023-78110M	023-78110M	100nF 50V ±20% Polyester Film Capacitor
C311, C312, C317, C318	024-08110M	024-08110M	100nF 100V ±20% Polyester Film Capacitor
C159, C160, C707	023-78147K	023-78147K	470nF 50V ±10% Polyester Film Capacitor
C131, C132	025-77222K	025-77222K	2.2nF 50V ±10% Polypropylene Film Capacitor
C117, C118	025-77268J	025-77268J	6.8nF 50V ±5% Polypropylene Film Capacitor
C113, C114	025-78024J	025-78024J	24nF 50V ±5% Polypropylene Film Capacitor
C709	027-78147M	027-78147M	0.47uF 50V Electrolytic Capacitor
C704	028-08210M	028-08210M	1uF 100V Electrolytic Capacitor
C908	028-08247M	028-08247M	4.7uF 100V Electrolytic Capacitor
C105, C106, C129, C130, C301, C302, C319, C320	027-79010M	027-79010M	10uF 50V Electrolytic Capacitor
C703, C708, C909	027-29022M	027-29022M	22uF 10V Electrolytic Capacitor
C303, C304, C331, C332, C705, C706	027-29047M	027-29047M	47uF 10V Electrolytic Capacitor
C109, C110, C121, C122, C145, C146, C155, C156	027-59047M	027-59047M	47uF 25V Electrolytic Capacitor
C345, C346, C347, C904, C905 C910, C911, C914, C915	027-99047M	027-99047M	47uF 80V Electrolytic Capacitor
C701, C702	027-29110M	027-29110M	100uF 10V Electrolytic Capacitor
C147, C148	027-59110M	027-59110M	100uF 25V Electrolytic Capacitor
C912, C913	027-79110M	027-79110M	100uF 50V Electrolytic Capacitor
C115, C116, C123, C124, C309, C310	027-29122M	027-29122M	220uF 10V Electrolytic Capacitor
C902, C903	028-09168M	028-09168M	680uF 100V Electrolytic Capacitor
C803, C806	027-59310M	027-59310M	10000uF 25V Electrolytic Capacitor
C804, C805	027-79310M	027-79310M	10000uF 50V Electrolytic Capacitor
DIODES			
D101, D102, D103, D104, D105, D106, D107, D108, D109, D110, D111, D112, D301, D302, D303, D304, D313, D314, D315, D316, D327, D328, D329, D330, D701, D705, D706, D708	1N4148	031-1N4148	1N4148 Signal Diode
D707, D901, D902, D903, D904	1N4003	032-1N4003	1N4003 Power Diode
D801, D802, D803, D804	1N5402	032-1N5402	1N5402 Power Diode
D317, D318, D319, D320	1SS81	031-1SS81	1SS81 Signal Diode
D323, D324, D325, D326	BY500-100	032-BY500100	BY500-100 (G.I.) Power Diode
D805	B80C	035-B80C	100 PIV 5A (G.I B80C) Bridge
D305, D306, D307, D308, D309, D310, D311, D312	B24	033-B24	B24, 3V9, 0.4W Zener Diode
D703	B1G	033-B1G	B1G, 5V6, 0.4W Zener Diode
D331, D332, D333, D334	A29	033-A29	A29, 8V2, 0.4W Zener Diode
D905, D906, D907, D908	27Z	033-27Z	27Z, 27V, 0.4W Zener Diode
D806, D807	1.5KE30	033-1.5KE30	1.5KE30 Transient Voltage Suppressor
D709	L-424YDT	034-L424YDT	3mm AMBER LED (L-424YDT)
D710	L-469EGW	034-L469EGW	3mm RED/GREEN LED (L-469EGW)

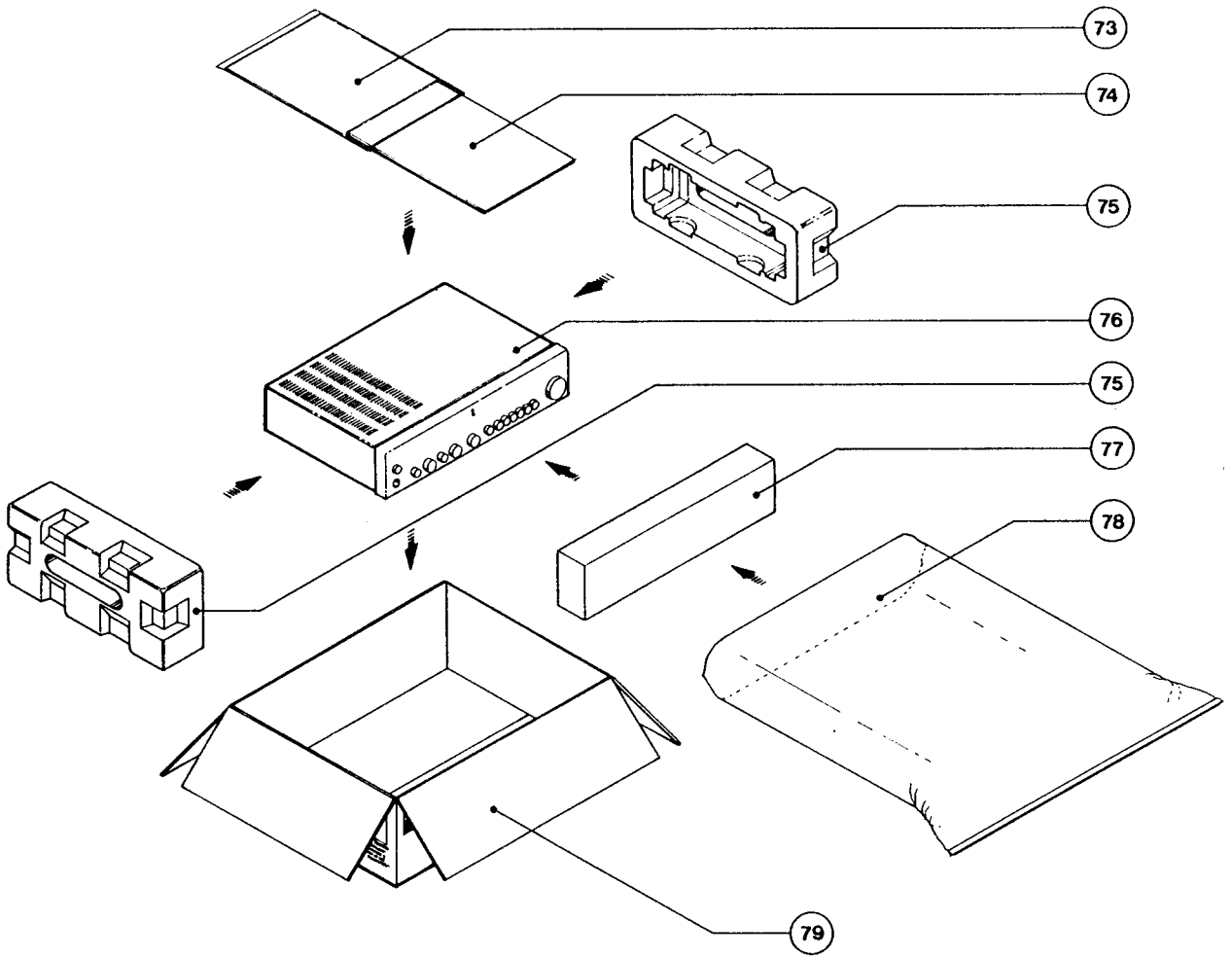
ELECTRICAL PARTS LIST (CONTINUATION)

SYMBOL NUMBER	REFERENCE NUMBER	PART NUMBER	DESCRIPTION
TRANSISTORS			
Q201, Q303, Q304, Q307, Q308, Q309, Q310, Q313, Q314, Q337, Q338, Q341, Q342, Q347, Q348, Q903	2SA970 GR	041-2SA970 GR	2SA970 GR Toshiba Signal Transistor
Q105, Q106, Q107, Q108, Q115, Q116, Q345, Q346, Q701, Q703	2SA1015 GR	041-2SA1015 GR	2SA1015 GR Toshiba Signal Transistor
Q109, Q110	2SA1316 BL	041-2SA1316 BL	2SA1316 BL Toshiba Signal Transistor
Q321, Q322	2SA1370 E	041-2SA1370 E	2SA1370 E Sanyo Signal Transistor
Q331, Q332	2SA1386	042-2SA1386	2SA1386 Sanken Power Transistor
Q335, Q336, Q904, Q906	2SB631 E	042-2SB631 E	2SB631 E Sanyo Power Transistor
Q325, Q326	2SB649	042-2SB649	2SB649 Hitachi Power Transistor
Q327, Q328	2SB826 R	042-2SB826 R	2SB826 R Sanyo Power Transistor
Q111, Q112, Q113, Q114, Q343, Q344, Q702, Q704, Q705, Q706, Q708, Q709, Q710	2SC1815 GR	041-2SC1815 GR	2SC1815 GR Toshiba Signal Transistor
Q101, Q102, Q103, Q104	2SC1815 LGR	041-2SC1815 LGR	2SC1815 LGR Toshiba Signal Transistor
Q301, Q302, Q305, Q306, Q311, Q312, Q315, Q316, Q902	2SC2240 GR	041-2SC2240 GR	2SC2240 GR Toshiba Signal Transistor
Q319, Q320	2SC3467 E	041-2SC3467 E	2SC3467 E Sanyo Signal Transistor
Q329, Q330	2SC3519	042-2SC3519	2SC3519 Sanken Power Transistor
Q339, Q340, Q901, Q905	2SD600 E	042-2SD600 E	2SD600 E Sanyo Power Transistor
Q317, Q318, Q323, Q324	2SD669	042-2SD669	2SD669 Hitachi Power Transistor
Q333, Q334	2SD1062 R	042-2SD1062 R	2SD1062 R Sanyo Power Transistor
Q117, Q118	2SK363 BL	043-2SK363 BL	2SK363 BL Toshiba FET
IC			
IC701	TA7317 P	051-TA7317 P	TA7317 P Toshiba (Prot) IC
POTENTIOMETERS			
VR303, VR304	071-29210	071-29210	1KB Trimmer Pot ALPS RH1051C, Idle Current Adj.
RV301, RV302	071-29310	071-29310	10KB Trimmer Pot ALPS RH1051C, DC Offset Voltage Adj.
RV103	073-39310	073-39310	2x10KC ALPS RK16312, Treble Pot.
RV201	075-49310	075-49310	1x10KW ALPS RK16311, Balance Pot.
RV101	072-19320	072-19320	2x20KA ALPS RK16312, Volume Pot.
RV105	073-39350	073-39350	2x50KC ALPS RK16312, Bass Pot.
SWITCHES			
SW1A-F/SW2A	081-00001	081-00001	7Key ALPS SPUN, Input Select Switch
SW1	081-00002	081-00002	1P1T w/o Screw Tap SMK JU-3066 or ALPS SDDLB, Power Switch
SW3	081-00003	081-00003	2P2T ALPS SPUN, 1A, 24V, w/o Screw Tap, Extra Spkr. Switch
SW4	081-00004	081-00004	2P2T ALPS SPUN w/o Frame, Tone Defeat Switch
SW701	081-00005	081-00005	2P2T Highly HSK-2210, Soft Clip Switch
TF701	081-00006	081-00006	110C NC Uchiya UP-62, Thermal Switch
TF702	081-00007	081-00007	90C NC Uchiya UP-62, Thermal Switch

ELECTRICAL PARTS LIST (CONTINUATION)

SYMBOL NUMBER	REFERENCE NUMBER	PART NUMBER	DESCRIPTION
JACKS			
J101	082-00002	082-00002	4P Gold RJ-1019-020AG, RCA Jack; Phono, CD
J102, J103, J104	082-00003	082-00003	6P Standard RJ-1017-02, RCA Jack; Video, Aux, Tuner, Tape 2 In/Out, Tape 1 In/Out, Pre Out, Main In
J601	082-00008	082-00008	JYE TAI JY-6312, Headphone Jack
FUSES			
F803, F804 * AH	084-00001	084-00001	5A, UL/CSA GTE, AH Only
F803, F804 * C & B1	084-00002	084-00002	5A, HBC, C & B1 Only
F801, F802 * AH	084-00003	084-00003	3.15A, UL/CSA, AH Only
F801, F802 * C & B1	084-00004	084-00004	3.15A, HBC, C & B1 Only
F901, F902 * AH	084-00005	084-00005	250mA, UL/CSA GTE, AH Only
F901, F902 * C & B1	084-00006	084-00006	250mA, HBC, C & B1 Only
OTHERS			
J2, J3	082-00001	082-00001	AC Outlet (AH Only)
J501, J502	082-00007	082-00007	Speaker Terminal Block, Nanjing
	082-00009	082-00009	Fuse Holder CQ-203S CQ
RLY701	083-00001	083-00001	Spkr Relay 2P1T Taiko DGX2-24M
L101, L102	091-20001	091-20001	3.7mH Toroid Coil
L301, L302	091-10002	091-10002	1 uH Air Cored Coil
TX1	092-10001	092-10001	Power Transformer
J1 * AH	082-00004	082-00004	AC Cord, AH Only
J1 * C	082-00005	082-00005	AC Cord, C Only
J1 * B1	082-00006	082-00006	AC Cord, B1 Only

PACKING DIAGRAM



ITEM	NAME	QTY
73	MANUAL POLYBAG	1
74	INSTRUCTION MANUAL	1
75	POLYFOAM END CAP	2
76	COMPONENT	1
77	EPE FASCIA COVER	1
78	UNIT POLYBAG	1
79	GIFT BOX	1

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SERVICE MANUAL

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INTEGRATED AMPLIFIER

NAD ELECTRONICS
LONDON

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